IN THE CLAIMS

This is a complete and current listing of the claims, marked with status identifiers in parentheses. The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A method for current measurement at a potential which is at a higher value than zero potential, comprising:

measuring the current value ~~being measured~~ in the form of an analog signal;

transmitting ~~and its~~ the measured information ~~being transmitted~~, after A/D conversion, in the form of a digital signal to an evaluation unit which is at ground potential, wherein

~~characterized in that~~ the analog signal is subjected to compression before A/D conversion and transmission, and ~~in that~~ the digital signal is subjected to expansion after transmission at ground potential.

2. (Currently Amended) The method as claimed in claim 1, ~~characterized in that~~wherein compression and expansion are effected logarithmically.

3. (Currently Amended) The method as claimed in claim 1, ~~characterized in that~~wherein compression and expansion are effected on the basis of the stipulation of root functions.

4. (Currently Amended) The method as claimed in ~~one of the preceding claims, characterized in that~~claim 1, wherein~~t~~ temperature compensation is effected.

5. (Currently Amended) The method as claimed in claim 4, ~~characterized in that~~wherein the measuring device and shunt are thermally coupled for the purpose of temperature compensation.

6. (Currently Amended) The method as claimed in ~~one of the preceding claims~~claim 1, in which, in order to evaluate a measurement signal which, at a higher potential than zero potential, is in the form of an analog value in a measuring device that requires a supply current, having the following measures:

- the compressed information content of the measurement signal is transmitted, after A/D conversion, in the form of a digital signal to the evaluation unit, which is at ground potential, and
- after A/D conversion of the measurement signal, the digital signal produced provides the clock for modulating the supply current, with the result that the modulated supply current for the measuring device likewise performs the function of the carrier for the information content of the measurement signal.

7. (Currently Amended) A circuit arrangement for carrying out the method as claimed in claim 1 ~~or one of claims 2 to 6,~~ for use when measuring the current at a shunt, in which the voltage drop is evaluated as a measure of the current after amplification, said circuit arrangement ~~having~~ comprising a shunt ~~(1; 61, 61', 61''; 71)~~, an amplifier ~~(2)~~ for the voltage signal that is tapped off at the shunt ~~(1; 61, 61', 61''; 71)~~, an analog/digital converter, ~~(3) and~~ an evaluation unit ~~(5, 65, 7) and also having~~, means for supplying the measuring components ~~(2, 3)~~ with current, ~~characterized in that~~and further means ~~(4, 6)~~ for signal compression and signal expansion ~~are provided~~.

8. (Currently Amended) The circuit arrangement as claimed in claim 7, ~~characterized in that~~further comprising means for

temperature compensation ~~are additionally provided~~.

9. (Currently Amended) The circuit arrangement as claimed in claim 7, ~~characterized in that~~wherein a unit for signal compression is connected upstream of the A/D converter ~~(3)~~.

10. (Currently Amended) The circuit arrangement as claimed in claim 7, ~~characterized in that~~wherein the means for signal expansion are integrated in the evaluation unit ~~(5, 65, 75), preferably in the existing microcontroller in the form of software~~.

11. (Currently Amended) The circuit arrangement as claimed in claim 8, ~~characterized in that~~wherein the means for temperature compensation ~~have~~ includes a temperature-dependent reference voltage source ~~(6)~~.

12. (Currently Amended) The circuit arrangement as claimed in ~~one of~~ claim~~s~~ 7 ~~to 11~~, ~~characterized in that~~further comprising means ~~(85, 95)~~ for at least one of short-circuit disconnection and~~/or~~ overload disconnection ~~are provided~~.

13. (Currently Amended) The circuit arrangement as claimed in claim 12, ~~characterized in that~~further comprising a first comparator ~~(85)~~, which compares the instantaneous value of the current with a first threshold value and produces a signal for short-circuit disconnection when said first threshold value is exceeded~~, is provided~~.

14. (Currently Amended) The circuit arrangement as claimed in claim 12, ~~characterized in that~~further comprising a second comparator ~~(95)~~, which compares the instantaneous temperature of the load with a second threshold value and outputs a signal for overload disconnection when said second threshold value is exceeded~~, is provided~~.

15. (Currently Amended) The circuit arrangement as claimed in claim 14, ~~characterized in that~~further comprising a thermal model ~~(94)~~ of the load ~~is provided~~, said model being used to ascertain the instantaneous temperature of the load ~~(80)~~ from the current measured.

16. (New) The method as claimed in claim 2, wherein temperature compensation is effected.

17. (New) The circuit arrangement as claimed in claim 7, wherein the means for signal expansion are integrated in the evaluation unit in the existing microcontroller, in the form of software.

18. (New) A circuit arrangement for current measurement at a shunt, at a potential which is at a higher value than zero potential, wherein a voltage drop is evaluated as a measure of the current after amplification, the circuit arrangement comprising:

an amplifier for amplifying a voltage signal that is tapped off at the shunt;

an analog/digital converter for converting the amplified signal subjected to compression before A/D conversion;

an evaluation unit, which is at ground potential, wherein the digital signal is subjected to expansion after transmission at ground potential; and

means for performing the compression and expansion.

19. (New) The circuit arrangement as claimed in claim 18, further comprising means for temperature compensation.

20. (New) The circuit arrangement as claimed in claim 18, wherein the means for signal expansion are integrated into the evaluation unit.